

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- BLACK BORDERS**
- IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- FADED TEXT OR DRAWING**
- BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- SKEWED/SLANTED IMAGES**
- COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- GRAY SCALE DOCUMENTS**
- LINES OR MARKS ON ORIGINAL DOCUMENT**
- REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- OTHER:** _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|------------------------|------------------------------|------------------|
| 09/839,459 | 04/19/2001 | Shubhendu S. Mukherjee | 1662-37000 JMH (P00-3157) | 2460 |
| 22879 | 7590 | 08/30/2004 | EXAMINER PAN, DANIEL H | |
| HEWLETT PACKARD COMPANY P O BOX 272400, 3404 E. HARMONY ROAD INTELLECTUAL PROPERTY ADMINISTRATION FORT COLLINS, CO 80527-2400 | | | ART UNIT 2183 | PAPER NUMBER |

DATE MAILED: 08/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | |
|------------------------------|------------------------|-------------------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 09/839,459 | MUKHERJEE, SHUBHENDU S. |
| | Examiner | Art Unit |
| | Daniel Pan | 2183 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 28 May 2004.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) 1-15 and 18-23 is/are allowed.
- 6) Claim(s) 16 and 17 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 19 April 2001 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All
 - b) Some *
 - c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____. | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____. |

1. Claims 1-23 remain for examination.

1. Claim 16,17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lomax (6,493,740) in view of Bressound et al. (5,802,265) .

2. As to the newly amended feature of duplicating the leading thread (see claim 16, last two lines), Lomax did not explicitly show the duplication of the threads though it showed the duplication of the context data in the thread (see the sharing of the segment copy by second thread 830 in col.14, lines 41-51). In addition to Lomax, Bressound clearly taught a replica of a leading thread (e.g. see fig.3, primary and backup replicas, , see also col.5, lines 30-44 for the e definition of thread and the replica process including the threads). It would have been obvious to one of ordinary skill in the art to use Bressound in Lomax for duplicating a thread as claimed because the use Bressound could provide Lomax the capability of the thread control in Lomax to preserve the data structure of the system , and therefore, reducing the wait time during the recovering or redundant process, and it could be done by predefining replica parameters of Bressound into Lomax, such that the specific data structure, such as the thread, could be recognized by Lomax, and for the above reasons , provided a motivation.

3. As to claim 17, Bressound also included cycle count (see col.5, lines 45-33).

Art Unit: 2183

2. Lomax is used as primary reference because it showed detailed structure of the thread, and the clear teaching of the replication of context data (e.g. see fig. 11).

3. Bressound is used as secondary because it showed the counter value as context data stored thread queue, and the duplication the thread (e.g. see the cycle count stored in a thread storage col.5, lines 45-53).

4. The rejections to claims 16,17 are maintained and incorporated by reference the last Office action on 03/25/04.

5. The response regarding rejections to claims 16,17 filed on 05/28/04 has been fully considered but is not persuasive.

6. In the remarks, applicant argued that :

7. a) applicant makes clear that the leading thread is a duplicate of trailing thread.

8. As to a) above, Bressound clearly taught replica of a leading process (see fig.3 , primary and backup replica processes [304][308]), see the process was defined as having threads (see col.5, lines 30-44). Therefore, Bressound 's threads were replicated . The reason why it would have been obvious to one of ordinary skill in the art to use Bressound in Lomax has already been given in paragraph # 2 in this action, therefore, it will not be repeated herein.

9. Upon further consideration and search, claims 1-7 are allowable over the art of record for reciting :

Art Unit: 2183

a) the combined features of the pipelined simultaneous and redundantly processor, the cycle counter, set of instruction processed by the simultaneous and redundantly processor in the leading thread and also in a redundant trailing thread to detect the transient faults, and the loading and replication of the cycle count in the trailing thread when the read cycle count command appears in the leading threads (claims 1-3);

b) the combined features of the pipelined simultaneous and redundantly processor, the cycle counter, the cycle count queue, the set of instructions processed by the simultaneous and redundantly processor in the leading thread and also in a redundant trailing thread to detect the transient faults, and the loading and storing of the cycle count in the trailing thread when the read cycle count command appears in the leading threads (claims 4,5);

10. Claim 8-15 are allowable over the art of record for reciting the combined features of the two redundant copies of the program thread and the avoidance of the false error caused by the incorrectly replicating the cycle count in the redundant program threads by the actual values from the cycle count reads in the first program thread for second program thread.

11. Claim 18-21 are allowable over the art of record for reciting the combined features of the two separate threads including substantially the same instructions , probing of the cycle counter to fetch the count value when the leading thread requesting the cycle count, the storage of the cycle count in the queue, the probing of the cycle count queue for the count value for corresponding cycle count requests in trailing thread, the execution of the cycle count requests in leading thread and training thread,

and the entries of the queue comprising the program count identifier and the cycle count .

12. Claims 22-23 are allowable over the art of record for reciting the combined features of the stalling the execution of the leading thread when the read cycle command was encountered in the leading thread , the execution of the trailing thread until the RCC command was encountered in the leading thread, and the fetching of the single copy of the cycle count from the counter and distribution of the count to both threads.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dan Pan whose telephone number is 703 305 9696. The examiner can normally be reached on M-F from 8:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chan, can be reached on 703 305 9712. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

21 Century Strategic Plan

DANIEL H. PAN
PRIMARY EXAMINER
SPCIP

